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FIELD TRIAL OF A TREE INJECTOR IN A WEEDING IN WEST VIRGINIA

In June 1960 a 5-acre plot of mixed hardwoods under intensive selection management on the Fernow Experimental Forest in West Virginia was weeded to eliminate poor-quality stems that were competing directly with desirable regeneration. Treatment was confined to stems in the 1- to 5-inch diameter (at breast height) classes.

A solution of 2,4,5-T (propylene glycol butyl ether ester) at 40 pounds acid equivalent per 100 gallons in diesel oil was applied in circumbasal cuts, one per inch of tree diameter, with an automatic tree injector. The work was done as a production job, and no special measures were taken to assure exactly uniform applications of the silvicide.

The injector used was a Tree-Di, manufactured by the Parker-Clower Company, Troy, Ala. This device is a 5-foot-long cylinder with a semicircular cutting bit at one end (fig. 1). The silvicide is released from the cylinder by a spring-loaded valve that is actuated by the impact when the cutting bit is struck into the tree stem.

Thirteen species were treated. However, 70 percent of the stems treated were sugar maple (*Acer saccharum* Marsh.) and beech (*Fagus grandifolia* Ehrh.).

After two growing seasons, 134 randomly selected stems were observed to determine kill by species and diameter class. The table shows, by diameter classes, the percentage of kill for all species and for beech and sugar maple separately. None of the dead trees showed any evidence of sprouting.

These results indicate that small stems are easier to kill than large ones. However, this apparent resistance among the larger stems may reflect

Figure 1. — Left: the silvicide injector. The silvicide in the tube (A) is released by a spring-loaded valve when the semicircular cutting bit (B) is struck into the tree stem.

Right: the injector in use. Injections should be made as near the ground line as possible, with the injector held at a 45-degree angle. The curved bit makes a cup-like wound that prevents runoff of the silvicide.

Figure 2. — Sugar maple is a hard species to kill. In this tree the cambium has survived and proliferated between injector cuts.

Table 1. — *Percentage of kill attained with injector and 2,4,5-T*

D.b.h. class (inches)	All species		Beech		Sugar maple	
	Trees treated	Trees killed	Trees treated	Trees killed	Trees treated	Trees killed
	No.	*%*	*No.*	*%*	*No.*	*%*
1	23	96	5	100	8	87
2	47	64	16	75	23	52
3	37	62	14	57	12	42
4	18	50	3	67	9	22
5	9	44	—	—	6	17
All classes	134	66	38	71	58	47

inadequate treatment. With larger tree size, even spacing of the injector cuts becomes more difficult, particularly in heavy thickets. Several trees encountered during the tally had not received the prescribed number of injections, and the spacing of injections often was irregular.

The average overall kill of only 47 percent of the sapling-size sugar maples indicates that a more intensive treatment is required for adequate control of this species. The treatment used here undoubtedly would be even less effective on trees of pole and sawlog sizes. Kills of sugar maple and other hard-to-kill species probably could be substantially increased by closer spacing of the cuts to make complete or almost complete frills. Also, the use of an injector designed so that the operator could control the dosage per cut might result in better kills.

This test, while limited in nature, does provide useful information for planning future silvicide treatments with injectors in the mountain hardwoods of the northern Appalachian region:

- Sugar maple is difficult to kill and requires relatively intensive treatment.
- Injector cuts probably should be spaced more closely than they were in this test.
- Injectors that provide for operator control of the amount of silvicide per cut might be more effective than the tool that we used.

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